SHELL DAKOTA

1951

doc. 463

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

LOOSE-LEAF FIELD NOTEBOOK

9-137

K.M. Waage doc. 463

Trip on Dakota with

Ed Taylor.

1951

6266 Iowa; Sioux City Brick & Tile Co

6/5/51 Dr. Reeside: Excellent section showing all 5 parts of Dakota at Plainview – R.R. cut – Moffat tunnel betw. Boulder + Morrison.

Mowry facies is present at very base of Graneros on Wyo. line area. Has never seen it farther south.

Graneros has two ammonite zones in Colo — or if Mowry part present should have 3.

Greenhorn of Colo ≠ Greenhorn of Kansas. Type " " = upper member of Kansas Greenhorn, rest of Kan. ghn is in Graneros – starts at limey shale above siltstn? or upper ammonite zone?

Thinks Lee's correlations ok and probably permissible to extend Purgatoire terminology northward.

Type Greenhorn has 2 good zones in it.

Suggests talking to Bass in Denver.

6/6/51 Bill Pierce: Fuels starting subsurface study of Dakota in NE Colo. this winter. Suggests paper on terminology of Dakota in NE Colo. this winter as plans are to tie subsurface in with crop.

Believes oilfield terms should be extended. He and Harry Tourtelot discussed it with me and agreed good division would be Colo Spgs area + Arkansas Valley for Purg – Dak. and from Castle Rock N. the Black Hills terminology. Beds cut out betw. Colo. Spgs area + S. of Cessler + this gap if extended eastward would correspond with divide betw. Platte + Arkansas drainages.

Black Hills section – Newcastle (Dakota), Skull Creek (Glencairn – ?part or all?) Lakota, Fuson, Fall

River (Lytle)

6266

Sioux City trip with Ed Taylor
(June 1951 - on way to
Golden. Shell Fund)

Sioux City Rock Co.

Section of E. side of old quarry. — [illegible]

Disc.?

Section 2: Near Quarry - Coal City Brick

General

The lignite bed is [illegible] directly on the siltstone, [illegible] 2 or 3 feet [illegible] but [illegible] to the clay between lignite & siltstone.

Above lignite is black to dk gray shaly siltstone - [illegible] Graveros. From [illegible] because of this contains [illegible] Metasequoia, etc. in Iraq.

Clay mainly a sandy variety, also [illegible] lenses in [illegible] clay. None of opalized found in this area. Position [illegible] also [illegible] by [illegible] Mathews) and worker. Bathtub [illegible] Bit [illegible]

Below bottom clay is another lignitic zone [illegible] by another siltstone - sandy [illegible] still another clay with one [illegible] this - also [illegible] Sergeant Bluffs.

Section 2.

from base of slabby layer down

5' Grey to light gray slightly purple gray clay with partings of silt (white) [Sample 1 spot about 16" from top, Sample #2 channel of lower 3'.] 1" layer yellow-weathering clayey silt 4" [illegible] base.

1' Similar to above with another 1" parting of yellow-weathering clayey silt at base, (Sample 3)

3' Dark gray somewhat fissile shale with gypsum on bedding, Inoceramus frags, and some silt partings. At top 3/4" silt 4" shale 1/2 silt descending — These 2 silts + assoc clay in Sample 4. Sample 5 = 1 1/2 feet below silt base for Sample 4; Sample 6 is to bottom of ~~Sample~~ interval from Sample 5.

1' Zone of fine sand and silt with gray silty clay partings. Zone heavily iron stained laterally has concretionary ledges

1' Gray soft silty clay with silt partings in abundance, some pockets pyrite & hard concretions (septaria) with gyp crack filling (Sample 7)

1' As above but somewhat softer (Sample 8)

2 1/2' As above (Sample 9)

1' As above (Sample 10)

6" Gradual lith change to tough, hard silty clay shale. silt streaks. (Sample 11).

Section 2 (Cont.) Sioux City Brick and Tile Co.

7" Fine, ferruginous to crumbly to clayey sand. with conc. Fe; stained yellowish brown; some shaly streaks. (Sample 12)

6 to 8" Coal — lignite (See ~~note~~ ~~on~~ ~~Section~~ ~~1~~) This coal is quite lateral & rapidly grades to poor coal with many shale streaks.

5 or 6" Gray clay becoming dirty downward, mottled. Root casts where present.

3' Lacuna? at least in part. Siltstone, massive, soft to hard, locally sandy. Fracture, ~~uneven~~ conchoidal, bench former. Light gray with plant rootlets ~~throughout~~ fracture locally. Lower Fe concretionary zones.

6' Upper 3' hard silty gray clay with many laminae siltstone ~~zones~~ less silty toward. Lower 3' hard gray silty clay with ~~some~~ silt laminae.

Sample 12 - lower 2'

Sample 13 - middle 2'

Sample 14 - upper 2'

To base of quarry floor

About 3' from top local large siltstone concs. - very hard but only local breaks in laminae go thru. Marked zone of very silty zone with silty laminae. Laterally the upper 1 to 2½ feet of this zone is brownish gray — it is always full of silty burrows.

Section 2
Concretion key

1 thin cross low siltsta
Crbn fo grey grey with
black laminae, flat beds.
breaks along laminae

siltstone

sandy zone

oval calc zone barren

coal

shale

few small
oval

Section 2 (continued) on old road cut behind farm

From base of previous section [illegible] brackish concretions then [illegible] below base of 3 section bed in top of [illegible] zone.

Concretionary zone.

4' Silty gray clay, local concretions (hard beds) Sample 15.
Some [illegible] silty laminae most silt in clay.
Conc. zone at base, which is [illegible] and grades laterally into silty Fe cemented clay layers.

3' As above - Sample 16 upper half
Sample 17 lower half

2' Lignitic clay, brown, slightly silty lower 6" silty clay to clayey silt
Sample 18

3' Massive siltstone, gray-white, much Fe stained & Fe concretionary stringers. Similar to 2' [illegible] under upper layer. Appears to be fine ss locally.

3½ to 4' Hard dense fine grained sandstone. Fe stained in upper foot. Finely trough. Sample 19. This appears to be local channel.

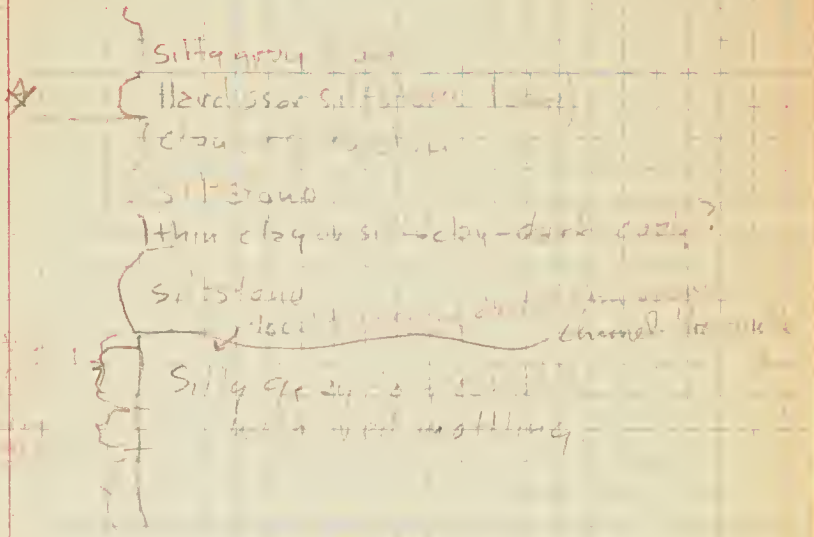
1' Fine sandy silt with clay laminae.

1½' Silty clay with silt [illegible] Sample 20. Grades into [illegible]

Section 2 (cont.)

4-6"	Fe-stained concretionary zone
2½'	Silty clay - 1' clayey silt at top. Fe staining. More clayey downward. At base light gray to gray.
Base	Section - bottom of bed ~~zone~~ not reached.

Sergeants Bluff Quarry, N. wall



Separate Plots

From road cut at top. — Section 3.

4' Light gray [illegible] clay, [illegible] Pockets and blebs of siltstone and pyrite cubes ~~throughout~~ 1" below upper foot + ½.

1' Dark, locally sticky [illegible] source of [illegible] lower 2 inches laminated silt and clay with thin seams coal up to ¼" [Sample 1 from upper 8" of this foot in [illegible]]

6' [illegible] light gray mostly fine silty clay [illegible] many plant root bits, some dark specks in lower 1' [illegible] have silty [illegible] base. [Sample 2 is spot from 2' above base of [illegible] interval].

6' Mottled gray clayey silt ~~clay~~ + ~~light~~ silty clay, carbonaceous specks and small ferruginous concretions specklike [illegible] foot below top 2 inches somewhat softer. [Sample 3 is spot 2' from top] Sample ~~4~~ 4 at base.] Basal 1½ feet light silty/fine sand but specks die out

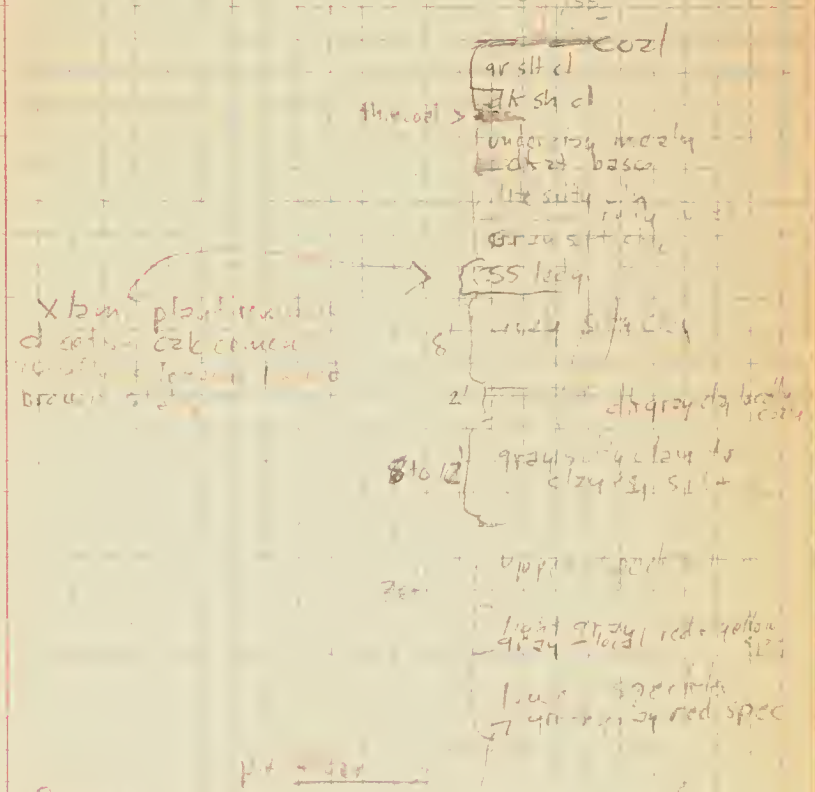
2' Silty clay at top grades from light gray silty clay to [illegible] clay. Zone of small hard Fe stained nodules at base 1 to 3 diam. [Sample 5 at base]

6' Silty gray clay with ferruginous silt concs mostly small fine sand

4' Highly silty [illegible] fissile & siltstone [illegible] edge heavy trend seen in [illegible] — [illegible] Sampled on graphic section

? Gray clay below.

Graphic of sec 3



Section 2

In quarry [illegible] appears cut out
at quarry end. [illegible] cut cave
layer of clay [illegible] caves in
in laws. (Ck.) [illegible] but this not clear, shown

[illegible] found [illegible] not
conclusive of [illegible] holes, as
[illegible]
[illegible]

[illegible]
[illegible]

Local problems.
The Morrison-Dakota contact at Morrison

Type Area: (Eldridge 1896) - Speaking of Morrison fm.- P. 60-62
"Its upper limit is sharply defined by the Dakota sandstone - - -"
The most important sandstone occurs just above the Atlantosaurus clays, [="clays of the lower two thirds"-] is very persistent, and from contained saurian remains has been called the Saurian sandstone. I varies in thickness between 5 and 35 feet, and its distance below the Dakota from 10 to 125 feet, although more generally from 50 to 80 feet."
"At the base [presumably of Saurian SS] is generally a conglomerate, of a maximum thickness of 8 feet, in which the pebbles so closely resemble those of the Dakota that, but for a slight admixture of red jaspor and the characteristic brown dots, the two layers could with difficulty be distinguished from each other. The shales overlying this sandstone are similar to those comprising the bulk of the Jura, but carry through them a number of minor sandstones and occasionally one or two strata of limestone."

Eldridge on Dakota-Morrison contact, (p. 63) S745
the base of the Dakota has a distinct conglomerate ~~very~~ which "varies from a thin almost imperceptable layer to 30 feet in thickness, and is composed of well rounded, smooth, in some cases almost glazed, pebbles from the size of a pea to a diameter of 1 inch."
? This important as it indicates Eldridges idea on boundary - there being only one such chert pebble cgl in that part of section. Seems certain that Lee, as Waldschmidt & Leroy (19 p. 1100) pointed out, confused issue by misinterpreting Eldridge (Lee 1920, p. 184) when redefining the Morrison.

Lee (1920)

Lee (1927) Continues to cloud issue. Gives measured section of type Morrison to replace old ones but his new section is way off on measurements compared to ours. Units can be recognized, however, tho they are not sufficiently detailed for close correlation. Among interpretations given by Lee, following are in error and responsible for the confusion over type Morrison.

1. Misinterpretation of Eldridge – this apparently came about through Lee's dependence on Prof Cannon "who claimed to have first-hand information gained by association on the ground with Eldridge and other early observers in the Denver region --" (p. 29) Cannon said that the two ss separated by 5'± clay were what was "originally interpreted for this locality" as the 2 ss and 'five clay' of the Dakota. Cannon pointed out base of 2nd ss as "base of Dakota of Eldridge and other early observers." As there is no cgl whatever here it could not possibly be what Eldridge meant (see Eldridge quote on cgl base Dak preceding page)

2. Lee – assuming that Eldridge's Morrison included all 'Dakota' below caprock at Bear Creek – generalizes

that the "upper part of Morrison as first delimited, which in this paper is correlated with parts of the Dakota group of the Bellevue section, consists of soft friable sandstone and sandy shale. The lower part of these beds is similar in color to the Morrison." (Knowltons fossil plants came from the "upper part of these beds."

Lee himself may not have right base to Morrison

3. Lee confuses Sauriau ss and basal Dak. chert. (p. 30)

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